AMERICAN ELECTRO-PLATERS SOCIETY

(An Educational Society)

Chartered 1909

MONTHLY REVIEW

JULY, 1916

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It is easier to put off the disagreeable task the second time than it is the first. But it grows harder to do the thing as the need grows older.

MONTHLY REVIEW

American Electro-Platers' Society

(An Educational Society)

Vol. 3 JULY No. 7

EDITORIALS

FORWARD.

By H. H. WILLIAMS, Supreme President.

The success of the year depends upon our plans, an early start to fulfill them, and upon the assistance of every member. I take this first opportunity to ask for large things from each Branch and each member.

To those who attended the Cleveland convention and caught the inspiration I feel you were well satisfied in learning of present standing and work of the A. E. S., as well as in the educational and social features enjoyed; so when the reports and papers are published in the Monthly Review you can assist in making the meetings of your respective Branches more interesting. This will increase the attendance at meetings and assist in securing new members. Then I wish to reach the isolated plater, the one away from where Branches are located, and who are entitled to enjoy with us the privilege our society affords. We have many of these men with us, some of whom have proved their value to our society, but there still remains so many that it is possible they do not appreciate the advantages of membership in the A. E. S. We should endeavor to reach every man eligible for membership and to do this I ask your co-operation.

THE CLEVELAND CONVENTION.

BY THE EDITOR.

The A. E. S. 1916 convention at Cleveland is now history. The minutes of that convention, when published, will show that much valuable and necessary work was accomplished. The technical papers read were of great interest. The discussion on them valuable. The social features will long be remembered. But the revision and adoption of a satisfactory constitution was certainly the feature of that convention.

In this connection Chicago and New York Branches deserve the thanks of the society for the many excellent amendments which they offered.

The convention was instructive, useful and enjoyable. The exhibits were fine. The banquet, a fitting culmination of a jolly time. My only regrets were that the time was so much taken up that the swimming race was crowded out.

AMERICAN ELECTRO-PLATERS' SOCIETY.

President's Report for the Year Ending June, 1916.

To the Supreme Society, American Electro-Platers Society:

The year 1915-6 began with a gradually increasing membership in spite of unsettled industrial and financial conditions throughout the country, and we finish with a very satisfactory increase in members, considering the continued disturbed state of business.

Every Society on this continent, whether fraternal or educational, has been confronted with more or less perplexing problems regarding maintenance of membership and general support of essential features—we may therefore feel gratified with present conditions of the A. E. S. and hope for greater gains during the coming year.

In June, 1915, I appointed a committee to edit the amendments passed at previous conventions, and to reconstruct the constitution. The committee finished their duties, but owing to differences in opinions among the supreme officers, the acceptance of the revised constitution was deferred until present convention in order to eliminate doubts as to the legality of certain clauses.

The delegates at 1915 conventions having voted to relieve the supreme society of the cost of publishing the "Monthly Review," and leaving the matter to the Executive Board to decide how payment should be made in future, I directed that the question of assessment of 10 cents per copy from each Branch be submitted to the Executive Board, and if favorably received to be adopted. The Executive Board voted to adopt this method of payment, but after three months of dissatisfaction among the Branches, it was voted to increase the per capita tax sufficient to defray publication expenses.

During June, 1915, a permanent charter was signed and delivered to Toledo Branch.

In July, 1915, efforts were made to begin the organization of Branches in Grand Rapids, Mich., South Bend, Ind., Pittsburgh, Pa., and Hartford, Conn. After three months of futile attempts the work was abandoned temporarily, but owing to illness later in the fiscal year, this feature of the work was not resumed.

The question of trophy purchases for best exhibits and papers brought out such diversified opinions and was greeted with such apparent little interest that this matter remains unsettled.

Objections to the "Assistant Foreman Plater" amendment began to appear in July and were dealt with carefully and impartially. New York Branch registered a protest which was placed before the Executive Board, and their findings submitted to the Branches for referendum vote. The result of this action failing to quell the disturbance, the question will greet the delegates at Cleveland in July, 1916.

On July 27th, 1915, Mr. J. H. Hansjosten resigned the position

of editor, and Mr. H. J. Richards of St. Louis, Mo., was immediately appointed to fill the vacancy. That Mr. Richards has made a brilliant success of the undertaking is evident. I wish to take advantage of this opportunity to thank Mr. Richards for his very commendable work during the year. Owing to his power of will, decision and action, the "Monthly Review" was published without delay following Mr. Hansjosten's resignation. His genial personality has entered into his work and good cheer and happy smiles were sent together with the literary efforts of our more progressive platers into the homes and hearts of our greatly separated members.

Arrangements were begun in June, 1915, for the 1916 convention in Toronto. Preparations were well nigh complete, when I was advised that there existed throughout the United States a very strong opposition to the chosen convention city, owing to present conditions throughout the British Empire. Although this information in modified form had reached me earlier in the year, the objections did not alarm this office, as every precaution had been taken to avoid possible unpleasantness.

During March, 1916, I became convinced that to continue with preparations for our convention on Canadian soil during the period of the war would be useless. I therefore advised the relinquishment of the convention.

Secretary Fraine very ably handled the situation and in a very short time Cleveland Branch accepted the convention and began work. The result of their efforts as shown today speak volumes for the energy and gift of our Cleveland members, and Mr. H. J. TerDoest in particular.

On Dec. 31st, 1915, I was stricken with a serious illness and on Feb. 2nd, after recovering sufficiently to get about, I went to Florida, and requested Mr. H. M. Williams, our First Vice President, to assume the duties of President during my absence. These duties he has cheerfully and efficiently performed, and I hereby thank Mr. Williams for the diligent attention given every detail which came before him, and for his kindly courtesy at all times during the year.

In March, 1916, a temporary charter was issued to Providence Branch, and on July 1st, 1916, I signed the permanent charter for them.

Returning to Toronto on June 6, 1916, I informed the Supreme Officers of my readiness to once more assume the dutie of my office.

The financial indebtedness of Newark Branch to the Supreme Society, and the silence and indifference of Buffalo Branch, have caused the Supreme Officers considerable concern during the entire year. Newark Branch has at last cleared about one-half her debt, and lends us some hope of future settlement of the balance, while Buffalo Branch has been regarded as defunct for some weeks.

In conclusion I desire to thank all who have assisted in making the Society a success during the past year. I feel particularly grateful to our esteemed Secretary and Treasurer, Mr. Walter Fraine. At every critical moment he has proven his ability as a tactful man. On him has fallen labors and duties which only a

clear thinking man could handle so successfully as he has done. He has displayed an exceptional interest in every detail. His work for the A. E. S. stands out in masterly perfection, and must be greatly appreciated by all.

I have the honor to be,

Yours respectfully,

W. S. Barrows,
President American Electro-Platers Society.

July, 1916.

AMERICAN ELECTRO-PLATERS SOCIETY.

Secretary's Report, 1915-1916.

The past year has shown a small but healthy growth of the membership of the society. The number of branch societies at the beginning of the fiscal year was sixteen, with a membership of 580. During the year, on March 16, 1916, one branch society, the Providence Branch, was organized with thirteen members and granted a temporary charter. An application for a permanent charter for this branch is before the Executive Board at this time. The location of the Providence Branch is such that it has a splendid field for future development and its members are enthusiastic regarding its future growth.

During the past year there have been 82 new members added to our rolls; 2 have died; 9 have resigned, and 30 have been suspended for various reasons.

We have to record the loss of one branch, Buffalo, which we are informed, has held no meetings since May, 1915. Your president, Mr. Barrows, and your secretary, have made every effort to reorganize this branch but have not been successful.

The Newark Branch, one of the largest numerically, has found itself unable to meet its current obligations to the Supreme Society during the past fiscal year. The Executive Board have carried them along believing that they would eventually repay any and all of their obligations.

During the year several questions of interest to the society were submitted to the branches for their consideration.

In September, 1915, on account of the depleted condition of the Supreme Society treasury a balance sheet showing the financial condition and a budget of estimated receipts and expenditures for the balance of the year was submitted to the various branch societies for their consideration and approval in connection with the question of levying a thirty-five (35%) per cent per capita tax with a monthly issue of the "Review," or a twenty (20%) per cent levy with a quarterly issue. The vote of the branches was in favor of the thirty-five (35%) per cent levy, as follows: Bridgeport, Chicago, Cincinnati, Detroit, Dayton, Indianapolis, Milwaukee, Philadelphia, St. Louis, Rochester, Toledo and Toronto (12), and three against, Cleveland, New York and Newark.

Owing to protests from individual members and some of the branches to the adoption by the 1915 convention of the amendment to the Constitution admitting assistant foremen to active membership in the society and a demand for its re-consideration, your sec-

retary by direction of the president, submitted a resolution to the various branches calling for a referendum vote by the members. Bridgeport, Cleveland, Dayton, Detroit, Indianapolis, Philadelphia, Rochester and Toronto voted in favor of retaining the amendment and six branches, Chicago, Cincinnati, Milwaukee, New York, St. Louis and Toledo voted for its rejection. Buffalo and Newark not voting.

As a result of a resolution adopted at the 1913 convention the decision to award a trophy for the best paper submitted and read at the convention was deferred until all of the papers submitted should have been published in the Monthly Review and a vote taken by the various branches.

This vote was called for in January, 1916, and the branches voted as follows: Chicago, Dayton and Toronto in favor of Mr. Barrow's paper on "The Commercial Aspect of Electro Plating With Cobalt;" Milwaukee and Newark in favor of Mr. Shepherd's paper on "The Metric System;" Cleveland and Detroit in favor of Mr. Ter Doest's paper on "Pitfalls;" Toledo in favor of Mr. Hogaboom's paper on "Some Solutions I Have Known;" Cincinnati and St. Louis in favor of Mr. Heil's paper on "Single Salt Solutions and the Results I Get," and Philadelphia in favor of Mr. Fraine's paper, "Some Experiments With Shot Nickel Anodes." Buffalo, Bridgeport, Indianapolis, New York not registering their vote.

Financial.

The treasury of the Supreme Society has for the past two years been overtaxed in proportion to its revenues. The action of the 1914 convention in changing the Quarterly Review to a Monthly and placing the expense of publication on the Supreme Society without a corresponding increase of the per capita tax levy to defray the added expense and to secure a balance sufficient to meet all other legitimate expenses and provide a sinking fund, has left the treasury in a position where any unexpected shortage in revenue is a serious matter. The loss of revenue this year through the default of the Buffalo and Newark Branches to meet their obligations to the Supreme Society would have left the treasury in a precarious position had the result of the vote to levy a thirty-five (35%) per cent per capita tax been otherwise than it was. At the beginning of the fiscal year there were not sufficient funds in the treasury to finance the Supreme Society until the first quarters' per capita tax became available. We recommend that the present rate of per capita tax (35%) continue through the present fiscal year in order that a balance may be acquired to secure a sufficient working balance.

Need of a Comprehensive Plan for Education of Members.

ThTe purpose of the A. E. S. is solely educational and we believe from our observation and information regarding the plans followed by the various branch societies along this line that the society as a whole is not accomplishing anything like it might accomplish by following its present methods. We believe that greater good to the members would result from the appointment of a committee to formulate a definite plan of education embracing electro-

plating and metal finishing methods, electro-chemistry, shop practice and business economics, using the Monthly Review as a medium for carrying on a course of lectures and instruction, such a plan to have a definite end in view in place of the haphazard methods prevailing during the past and at the present time.

CONCLUSION.

The past history and accomplishment of the Society have more than justified its conception and existence. The rapid growth of manufacturing calling for more and higher skilled and efficient electro-platers emphasizes the necessity for a society of this kind to fit them to meet the new conditions which are constantly arising. To accomplish this let us adopt a more comprehensive plan of education and we will reach a higher standard of knowledge of our art and its practice.

Respectfully submitted,

WALTER FRAINE,
Sec.-Treas., A. E. S.

THE SEC.-TREAS., A. E. S., IN ACCOUNT WITH THE SUPREME SOCIETY FOR THE FISCAL YEAR ENDING MAY 31, 1916.

BALANCE SHEET SHOWING RECEIPTS AND DISBURSEMENTS.

RECEIPTS.

Cash received from Past Treasurer	$ 104.65
W. S. Barrows (account postage)	2.40
Mr. Jos. Walters (Trophy account)	1.00
Per Capita Tax	821.54
Missouri Review account	205.35
Application blanks	8.10
Members cards	16.50
Charters	2.00
Constitution and By-laws	2.10
Electros	.50
Postage on Review	4.63
Miscellaneous	1.68
Total receipts	$1,165.43

DISBURSEMENTS.

Conv. expense	$ 18.50
Miscellaneous printing	39.00
Pub. of "Review," twelve issues	450.54
Secretary, salary account, 1915	50.00
Secretary, expense account, 1915	24.75
Secretary, salary account, 1916	60.00
Editor's salary account	83.00
Editor's expense account	24.09
Secretary's office expense	25.79
H. E. Willmore (back postage)	2.40
C. B. Willmore (typewriting)	9.48

W. S. Barrows (customs duties)	1.28
Philadelphia Branch (rebate on overpayment)	7.43
	$ 799.20
Total receipts	$1,165.44
Total disbursements	799.26
Difference	$ 366.19

WALTER FRAINE,
Sec.-Treas., A. E. S.

AMERICAN ELECTRO-PLATERS' SOCIETY.
BUDGET FOR 1916-1917.

RECEIPTS.

Cash in bank	$ 366.19
Per capita tax (on 35% basis)	1,000.00
Constitution and By-laws	50.00
Application blanks	6.00
Membership cards	15.00
Charters	2.00
Electros	1.00

DISBURSEMENTS.

Convention expense	$ 100.00
Supreme Officers' traveling expenses	100.00
Salaries	160.00
Editors expense	35.00
Secretary, office expense	30.00
Miscellaneous printing	50.00
1,500 Constitution and By-laws	45.00
Monthly Review (12 issues)	550.00
Total estimate disbursements	$1,070.00
Balance at end of year	$ 370.19

WALTER FRAINE,
Sec.-Treas., A. E. S.

EDITOR'S REPORT.

During the fiscal year which has just ended twelve editions of the Monthly Review were published and circulated among our members. There were 24 pages in each edition.

The local news of the various branches occupied five or six pages. The editorial one to one and a half pages. The balance, with the exception of the front cover, was filled with original matter of educational and practical electroplating matter, contributed with but two exceptions by members of the A. E. S. There were ten papers published about nickel plating, or which can be classed under the head of nickel; four on copper; four on silver; three on brass; two on cobalt; two on the copper clean and strike; two on metal coloring and oxidizing; two on pickeling; two on plating non-

metallic substances; two on anodes; one each on gold plating; the metric system; electro galvanizing; production of Verde green; electric cleaning; motion plating; the action of colloid agents; deposition by contact or immersion; plating die castings; special finishes; current regulation; shenardizing; and seven papers on general subjects of interest to electro platers. The papers were contributed by the various branches as follows: Cleveland leading with eleven; Chicago being second with eight; Newark and New York both six; St. Louis five; Detroit and Cincinnati four apiece; Toronto three; Milwaukee two; Philadelphia, Bridgeport, Buffalo, Dayton and Indianapolis each contributed one.

Thirty-six members of the A. E. S. have written papers for publication in the Review. They are distributed among the various branches as follows:

Cleveland and Chicago take the lead with seven apiece; New York has four; Newark, Detroit, Cincinnati and St. Louis each have three; and Indianapolis, Bridgeport, Buffalo, Dayton, Milwaukee and Indianapolis each have one.

Two papers were published which were not written by members of the A. E. S. One by Messrs Matthes, Stuart and Sturdevant on nickel plating, and one by Dr. Carl Hering of Philadelphia on pickeling. Permission to print both papers being secured by Mr. Joe Walters of Richmond, Va. Newark Branch contributed two papers which were just marked from Newark Branch; no contributor's name being on them.

We find that Mr. Barrows of Toronto, Mr. TerDoest of Cleveland, and Mr. Heil of St. Louis, lead their fellow contributors in number of papers with three apiece.

Messrs. Hogaboom of New York, Bierbaum of Milwaukee, Taylor of Newark, Lovering of Detroit, Werft of Cleveland, Dr. Watts of Chicago, Scott of Cleveland, Newark Branch (no name), are all in second place, each having written two papers.

The members who have contributed one paper are: Proctor of New York, Walsh of Indianapolis, W. Fraine of Dayton, Thompson of Chicago, Walters of New York, Shepherd of Buffalo, Richards of St. Louis, Burkhart of Cleveland, Davenport of Detroit, Barr of Philadelphia, Hall of Chicago, Nordman of Cincinnati, Willmore of Chicago, Thornton of Chicago, Wadsworth of Cleveland, Miller of Detroit, Easton of Cleveland, Sizelove of Newark, Lewis of Chicago, Robins of St. Louis, Farmer of Cincinnati, Faint of Newark, Baum of Cincinnati, Elwin of Bridgeport, Duffy of New York, Vance of Cincinnati, Wicks of Cleveland, Meggers of Chicago.

I would conclude by recommending that the Monthly Review be mailed direct from the editor's office to the individual member. The present method is cumbersome and inefficient, wasting labor, time and money. The packages are costing the individual branches as much for expressage or parcel post as the postage direct would amount to even under ordinary postal rates, and under second class mail privileges which we are entitled to the cost would be very little. It would expedite the delivery and save the local secretary much unnecessary work.

H. J. RICHARDS, Editor.

ANODES.

By Fred J. Liscomb, Chicago Branch.

Some months ago Mr. Richards, our much hyphenated editor-poet-scholar, gave me several orders, chief among them, one for an article for The Review on the subject of Anodes.

Since going over the Review of February of this year, I find that he became tired of waiting for me and wrote one himself, he said in part, that:

"Anodes are pieces of metal suspended in a plating solution. They are composed of any metal that is plated and some that are not. Anodes convey the current into the solution; the more anodes, the more current. Anodes are also alleged to supply the solution with metal."

Sure, some do, but it is a mystery to Katy, why any one capable of imparting so much knowledge in so few lines, should pick on me however.

We learn from other scholars that the word Anode is derived from the Greek words "Ana," meaning "up" and "Ode" meaning "away." The word Anode therefore means "up and away."

As we progress in the art of electro-plating we soon discover that unless anodes are endowed with that "up and away" characteristic while hanging in the plating solution under the influence of the electric current, there is soon trouble with the solution.

In order that an anode may "up and away" then, it must have certain properties which render it soluble in all nickel plating solutions, or we must so change the solution that it will cause the metal to dissolve from the anode to reimburse the solution for the metal of which it has been divested at the cathode.

If the anode is not freely soluble in the bath and therefore does not replace the metal withdrawn at the cathode, then we find that the bath soon becomes acid in proportion to the metal withdrawn. And unless we provide the bath with a neutralizing factor, an Aqua Ammonia or Carbonate of Nickel, the deposit soon indicates the present of acid by becoming scanty and brittle.

In using 97-99 per cent Nickel Anodes in a single salts solution, the addition of Nickel Carbonate is recommended as it regenerates Nickel Sulphate. Aqua Ammonia is to be avoided as it causes the gradual formation of Sulphate of Ammonia; this, then, in turn combines with the single nickel salts to form double salts.

If it is suspected that acid is being liberated while the bath is in action, a simple test can be made by placing a piece of blue litmus paper in contact with the anode under the surface of the solution. The blue paper will turn red if the anode is not dissolving freely—with insoluble anodes the color of the paper changes very rapidly.

It might be said parenthetically that several of the enthusiastic advocates of pure anodes with a single salts solution are gradually working their solutions over into the old stand-by double salts solutions as they have found that the old solution is less liable to pit—all theoretical evidence to the contrary notwithstanding.

Some makes of nickel anodes are very soluble, while other makes are dissolved with difficulty even in sulphuric acid.

The prospective purchaser of nickel anodes is frequently heard to remark: "Nickel is Nickel; they assay 90-92 per cent, therefore they must be good." So, too, "Pigs is pigs," but the hams of a guinea pig are not much in demand by the sandwich makers.

But to get back to nickel anodes. While it may be true that the anodes do analyze 90-92 per cent, or any other percentage which may have been ordered, yet there is a difference between the anodes cast by one melter and those cast by another melter, just as there is a difference in the iron used in making castings. In the iron foundry they find that unless the iron has certain properties, and unless certain conditions prevail, the resulting castings are so hard that they cannot be drilled—or perhaps they shrink too much, or not enough.

So, too, with metallic nickel. Unless certain methods and conditions prevail, the resulting casting, or anode, would be more successful as a sash weight than as an anode for nickel plating.

The ideal nickel anode should be soluble in any nickel solution, whether made from double or single salts. It should dissolve away, leaving no residue whatever, just as does a silver or gold or copper anode.

Inasmuch as nickel cannot be melted except at a very high temperature and never comes from the open fire as pure as it went in, it becomes necessary for the maker of anodes to provide a suitable means for reducing the metal to a fluid state and casting it with the least deterioration possible. This is done to the best of the melter's knowledge, many times with indifferent success.

While the percentage of purity may be all that is claimed the pictures show that there is a difference in the physical structure of the several anodes photographed, as the surfaces of many of them are a mass of very hard nickel crystals. Some of the specimens have been in the solution and in constant use for several years without having been materially attacked.

One of the important things to be considered by the buyer of anodes is, how much of the anode does *not* go into the solution but is lost in the slime scraped from the anode while being cleaned from time to time?

This black scale, or slime, has been regarded as a necessary evil, and to a certain extent this is true since a slime forms on all makes of anodes. But there is a vast difference in the quantity of metal contained in the slime, or scale, taken from the different makes of anodes, there being no two of them even approximately the same.

If the scale is heavy and the quantity large, it is a factor that must be considered and it behooves the consumer, then, to become acquainted with a method for testing scale for its metallic content.

An easy method is to scrape each make of anode separately, being careful that the scale from the different makes does not become mixed. Each sample should be washed several times in hot water, taking care to allow the fine particles to settle each time before decanting.

When all salts and soluble matter have been dissolved out, the

mass may be dried on a filter, or by any other suitable means. Each sample is then placed in a bottle and laid aside for future consideration.

When all the samples have been treated in this manner, procure a number of 25-CC vials, preferably long and narrow. Then weigh off very accurately, say five grams of each sample, placing each in a separate vial which of course must be dry. Cork the vial and mark it with the name of the maker of the anode, or in any other way so that you will know which is which.

If directions have been correctly followed, the bulk in the several vials will differ with the specific gravity of the samples. Those samples that contain the most metallic nickel will appear to have the smallest bulk in the vial, while those lighter in metallic nickel will more nearly fill the bottle, as this case is light and fluffy.

Placing the bottles side by side, the height of the material in the vials will be along the line of the accompanying diagram. The contents of each vial weigh the same, yet the bult varies considerably. This is due to the presence of metallic nickel in greater quantities in some than in others.

The reason for this is because the anodes are not of the same solubility. Many only disintegrate, leaving small particles of metal in the carbon and carbides; these eventually fall to the bottom of the tank or are scraped away and lost.

The diagram was made from eight such samples, numbered from one to eight. The scale was taken from anodes in actual use in factories where much plating is done. No. 1 and No. 3 are from two makes of anodes used in the same tank and under the same working conditions. Hence you will understand that the difference is not due to a difference in the solution. All of the eight are from anodes that were said to be of 90-92 per cent purity. The percentage of metal contained in the eight samples from which the diagram was made was from about 3 per cent metal for No. 1 to quite 9 per cent for No. 8. The figures were secured by an analysis.

A very good idea of the metallic content of the scale may be obtained roughly by a magnet. To do this, take the vial containing the dried sample; hold it in a horizontal position with the scale in the bottom end. Now place a strong horseshoe magnet above the vial, the magnet to be in contact with the glass at the end where the powder is. Then slowly move the magnet toward the other end of the vial. If the powder is rich in metallic nickel a large mass of the contents of the vial will follow the magnet on the inside top surface of the vial and will be in proportion to the metal present.

In No. 8 nearly the whole mass followed the magnet, while in No. 1 only a trace of metal followed the magnet. This test is only comparative, however, and gives no information as to the percentage contained. But if you have several makes of anodes in your tanks, you can by this test tell very quickly which anode is dissolving and more nearly feeding the solution, and in this way you can tell which anode is the most economical. The advantage of this test is that it costs little to try out.

In the diagram there is evidence that all anodes are not equally soluble. If then, in your tests by this method you discover that the anodes in your tanks act like No. 8 they cannot be considered as first class, hence are not suitable for plating purposes and should be avoided.

If the anode is completely soluble, the solution remains unchanged so far as the metallic content is concerned—a very desirable condition, but it seldom prevails. On the other hand, if the anode be not corroded to the same extent that metal is deposited, the solution loses metal as stated above, and trouble follows unless some means is provided to neutralize the acid set free when the anode fails to furnish sufficient metal.

With a perfectly soluble anode the only E. M. F. required is a quantity sufficient to overcome the electrical resistance of the solution.

As nickel anodes are never *perfectly* soluble, the E. M. F. then, will vary with their degree of solubility. The more nearly the anode in use in the solution approaches perfect solubility, the lower will be the counter E. M. F. or polarization factor.

This counter E. M. F. can be measured easily on a voltmeter after the applied E. M. F. has been shut off. It will be found to vary from a small fraction to nearly one volt.

If this counter E. M. F. is high, then we must increase the direct E. M. F. to just balance the counter current—otherwise the deposition will not proceed in a proper manner.

Burgess says "that the lower the current density at the anodes, the more nearly does the amount of metal corroded correspond with the electrochemical equivalent. With the commercial forms of this metal the current density must be kept below five amperes per square foot in order that a high current efficiency may be attained.

This in turn requires that the anode should present as large an ACTIVE SURFACE as possible. This term ACTIVE SURFACE does not mean merely the area of surface exposed to the electrolyte from which the current flows.

Since by far the greater portion of the current leaves the anode from the edge, it is manifest, then, that the most efficient anode is one of a shape that will permit the current to flow from the whole surface, thus making the whole surface ACTIVE."

This idea was in mind when the elliptic anode was invented by one of our members, H. E. Starrett by name. The use of such an anode gives the maximum amount of ACTIVE SURFACE per foot length of tank. In a single salts solution it becomes an absolute necessity to have all the ACTIVE SURFACE possible, as with a small surface and high current density in the presence of sodium chloride, there is an opportunity for the formation of nickel hydroxide which is frequently mistaken for the well known iron precipitate found in all nickel solutions. If the anode be only partially soluble, it disintegrates instead of dissolving and the particles falling to the bottom of the tank are lost.

In at least one instance it was discovered that the slimes contained fifty per cent of metallic nickel, fifteen per cent of which was in the form of nickel hydroxide.

This condition could be relieved by adding sulphuric acid were it not for the fact that the presence of even small quantities of this acid prevents the solution from working up to a high percentage of efficiency. But the relief would be only temporary, as the deposit would be scanty—perhaps entirely absent if the quantity of acid was large. It would, however, cause the anode to be more readily dissolved, besides dissolving any dydroxides of iron and nickel that might be present, until a point was reached where all the sulphuric acid had been converted into sulphates of nickel and iron, when the old condition would again prevail.

Will the Editor please be informed that the "feller" has "kicked in" as agreed.

PATINA—NATURAL OXIDIZING.

By Mr. Brod, Newark Branch

The name Patina and its meaning will no doubt be familiar to you all. It was well known by the old Romans and Greeks, who thought it of very great value and guarded it closely. Their firearms and emblems were covered with this Patina, which, in olden times, was imperfect, but which has now been worked out for modern use.

There exists a natural Patina which works by itself through the hydrogen and oxygen which plays the most part in the work. The different mixtures of Patina will produce the greater number of Patinas. There is produced, through the working of chemistry and art, an imitation Patina. Along this line the French and Italians stand first because of their good taste in style and art.

We cannot wait for the producing of natural Patina because the process is very slow. However, we have the chemist to thank, that through his competition against the natural reaction and skilled hands, we now have perfect results.

There exists three different ideas in regard to Patina: (1) Copy of the Natural, (2) The Idea of the Artist, (3) Commercial. I will endeavor to make you familiar with a few of the processes used a few years ago.

Verde Antique.

For metal composition with less copper in, through stippling, use the following formula:

20% Acid Acetate	1 liter
NH_4Cl Sal Ammoniac	16 grams
Sea Salt	18 grams
26% Ammonia Liquid	17 grams

Use the stippling process three times and lacquer the work. To make the above Patina dark or light, use the following formula in like manner as the above is used:

20% Acid Acetate.	
NH_4Cl Sal Ammoniac	32 grams
Ammonia Liquid	40 grams
Yellow Chrome	50 grams
Green Chrome	30 grams

Let this process dry and then lacquer it and then wax with a brush. If necessary to change the color further, add more green or yellow chrome.

An Old French Process—Brown With Green.

1 part of Horn Powder.
4 parts of Oxide Iron.
4 parts of Acetate of Copper.

Mix this with 50% acid acetate so it forms a medium thick solution. Let it dry and then burn off with a torch and brush well with a brass scratch brush. The oftener the above process is repeated, the darker it will turn out.

Italian Process.

The following solution to be used by stippling:

1 part Nitrate of Potash.
1 part Sea Salt.
2 parts NH_4Cl Sal Ammoniac.
95 parts Acid Acetate.

Let the above dry and go over with a torch and brush off with a brass scratch brush and then work over with wax.

Old Japanese Process.

Paint the work to be colored with the following solution:

2 parts Acetate of Copper.
2 parts Cinnober.
5 parts Sal Ammoniac.
5 parts Alum.

Mix with 50% Acid Acetate, burn it over a coal fire. If copper vitrial ($CuSO_4$) is added to the above solution it will turn a darker brown, but if a more yellowish color is desired, add borax to the solution.

Statuary Color.

Dissolve 25% of 95% of ammonia with "Stibium Sulfuratium Aurantiacium" (antimony sulphide). Paint the work over and let dry. If a darker tone is desired, give two or three coats, letting each coat dry and brushing after each coat is applied. Very good results may be obtained when skill is used.

SHOW THY LIGHT.

"Neither do men light a candle and put it under a bushel, but on a candlestick and it giveth light unto all that are in the house."

Little men are satisfied with little honors. They pin medals on themselves.

Do right and fear no man—don't write, and fear no woman.

When you are certain that you need a thing don't delay getting it. Holding off isn't economy.

It is easier to put off the disagreeable task the second time than it is the first. But it grows harder to do the thing as the need grows older.

EXTRACT OF LETTER FROM E. W. HEIL. WICHITA, KAN.. TO G. S. ROBINS, ST. LOUIS, MO.

You say that Mr. Richards and yourself are conducting experiments to determine the minimum amount of boric acid and the best chloride to use in still nickel plating. I have added boric acid to my still solutions you might saly in a lavish manner taking care only that I did not reach the point of saturation. I had no way to determine the amount of borates the solutions contained and so would add boric acid the same as a plater would add a brightener to a copper bath (just when I thought it needed it). A knowledge of the minimum amount to use to obtain desired results would be welcome.

It has been said on good authority that boric acid added to a bath causes the deposit to become brittle. It is possible to obtain a good soft deposit, using boric acid. A plater may be using two volts on a nickel tank and be getting a fairly soft deposit. He may then add boric to the bath and increase the current density, although he still maintains the same voltage. He may then find the deposit somewhat brittle and not know the rate of deposition was responsible if he did not watch the ammeter.

I have also experimented with chlorides and would be pleased to find out what you decide on. I believe nickel chloride will get the results. I began plating with a single salt solution with sodium chloride and added barium chloride from time to time, watching results until I had precipitated all the sulphates in solution. As the percentage of nickel increased the conductivity increased and the deposit got softer. This solution had one ounce table salt in it, but I think a good simple nickel solution would be one of nickel chloride and nickel sulphate with nothing but nickel catchion in it. I wish you would try it out.

One ounce of $BaCl_2 2H_2O$ will form .971 oz. nickel.

20.85 ounce of $BaCl_2 2H_2O$ will precipitate the sulphates out of 24 oz. nickel sulphate in solution.

Heat the nickel solution to boiling and add barium chloride previously dissolved in hot water filter out insoluable $BaSo^4$.

$$BaCl_2 2H_2O + NiSo_4 7H_2O NiCl_2 6H_2O + BaSO_4 + 3H_2O$$
$$244.32 \qquad 280.86 \qquad 237.60 \qquad 233.44 \qquad 54.06$$

When nicarbonate is added to a freshly made nickel sulphate solution little if any of it dissolves, but if plating is carried on rapidly as I did in so little a volume of solution there is danger of it becoming acid. When the anodes do not keep up the nickel conten' of the solution it leaves the SO^4 radical to unite with hydrogen to form sulphuric acid. The nickel carbonate will take care of this and not introduce any inert matter in the solution. At first I put the carbonate in the solution, afterwards I put it in muslin bags and tied them among the anodes. When I made the solution I put in the amount I mentioned in the paper, afterward I put it in the bags just when needed. No particular amount, just its presence, it only dissolves when acid is formed. I do not maintain that it is always necessary, but that it was necessary the way I worked that solution. I used plastic $NiCO^3$.

WHAT THE BRANCHES ARE DOING

INDIANAPOLIS.

Meets second Saturday of each month at Hotel Dennison. Secretary, Louis Mertz, 1725 Union Street, Indianapolis, Ind.

Our June meeting was presided over by President Aufderheide with a fair attendance.

The newly elected officers were installed. The secretary's books were audited for past year and declared O. K.

Some time was taken in discussing exhibit for A. E. S. convention..

Decided that each member sending an exhibit mount same, crate and ship by express not later than July 3rd. Branch to stand shipping expense.

Delegate to convention receive instructions.

Adjournment until July meeting, July 8th, 1916.

DAYTON.

Meets first Wednesday of each month at the Y. M. C. A., Dayton, Ohio, Secretary, Alphonz Lamourcux, 500 East First Street, Dayton, Ohio.

Dayton Branch held its meeting on Wednesday, July 12, at which we had a very good attendance and after disposing of the regular business of the evening we listened with great interest to the report of delegates to our recent convention and from the report made it certainly must have been a grand success in every way and the society in general has been able to report another year of successful profit, both in numbers and in knowledge gained, and I can assure you the watchword of Dayton Branch will be, "On to St. Louis in 1917."

We were pleased to receive the transfer of Bro. W. H. Taylor of New York Branch, who is at present employed by the Fireproof Furniture Co. of Hiamasburgh, Ohio.

PHILADELPHIA.

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Streets Secretary, Philip Uhl, 2432 North 29th Street, Philadelphia.

The regular monthly meeting was held Friday, July 7th. Owing to being vacation time, there was a small attendance. Only the regular routine of business was transacted.

NEW YORK.

Meets second and fourth Friday each month. Secretary, Frederick Haushalter, 82 Hull St., Brooklyn, N. Y.

The regular meeting held on Friday evening, June 23rd, with Pres. H. H. Reama in the chair, had a very good attendance.

After the regular business had been transacted the newly elected officers were installed.

President—Herman H. Reima re-elected.
Vice-president—John Painter.
Financial Secretary—Wm. Fischer, re-elected.
Recording Secretary—Frederick Haushalter.
Librarian—J. A. Stiemel.
Sergeant-at-Arms—Wm. Betts.
Asst. Sergeant-at-Arms—John Sterling.
Trustees—Jos. Minges, Thos. R. Haddon, Jos. A. Straub, A. A. Dabolt, Chas. Buchanan.

Mr. Faint of the Newark Branch, assisted by Mr. Smith of the same branch, officiated as installing officers, and too much praise cannot be extended to Mr. Faint for the way he instructed and advised them to be successful in their respective duties.

Four new applicants were elected to membership.

ST. LOUIS.

Meets third Saturday of each month at Public Library Assembly Rooms. Secretary, F. C. Rushton, 4405 Blair Avenue, St. Louis, Mo.

The regular monthly meeting of the St. Louis Branch was held June 17th, in the assembly room, at the St. Louis Public Library, at which time the subject of the 1917 convention was taken up and the delegates to the Cleveland convention were instructed to use every effort to obtain the convention for St. Louis.

Mr. Dubelbeis gave a very interesting half-hour talk on the successfulness of simultaneous copper plating and cleaning.

CHICAGO BRANCH.

Meets fourth Saturday of each month, 8 p. m., Western Building, Randolph Street and Michigan Avenue. Secretary, Oscar E. Servis, 3020 George Street, Chicago, Ill.

The regular meeting of the Chicago Branch was held June 24th. President J. P. Manz, presiding. After the regular routine of business, the delegates of the convention were instructed as to the wishes of the Branch. Mr. E. Lamoureux requested the floor and in an eloquent speech on behalf of the Chicago Branch presented Past President O. E. Servis with the gavel he has used during two terms of office. Mr. Servis replied, thanking Mr. Lamoureux and the members for their warm friendship and co-operation while in the chair, and the attachment he felt towards the Society.

The following questions were discussed:

Is it advisable to use Citrate of Ammonia in Nickel Solutions?

What causes comet-like streaks or pits on the work in a Silver Solution, also what causes the Anode to remain in a pink condition while the bath is not in use.

A good attendance is anticipated from this Branch at the Convention.

NEWARK.

Meets first and third Friday of each month, 8 p. m., 47 Bank Street, Newark, N. J. Secretary, Geo. Reuter, Jr., 333 S. 19th

On Friday evening, June 6th, 1916, the Newark Branch, A. E. S., held one of their most successful open meetings.

The meeting was opened in due form by our President, Edward W. T. Faint. After a few brief remarks of welcome to the members and visitors, then introduced Mr. Thomas Haddow, former president of New York Branch, who, with the help of Mr. Sterling, also of New York Branch, installed the officers. Mr. Haddow congratulated the officers upon their election and gave to each brief instructions as to their duties, and also reminded each on the importance of his office.

President Faint then outlined a brief history of the society, for the benefit of the visitors present, telling of the society's educational value to each member.

Mr. George Neimieyer was introduced as the next speaker and gave a very interesting talk on silver. That the rise in price from 47 to 77½ cents an ounce in a little over a year, a percentage of 33½ per cent. The present trouble in Mexico and the European war are the too foremost causes. United States and Mexico produce about 75 per cent of the world's silver. Mexico produces about 60 per cent, but on account of the civil strife most of the mines are closed. The men in the trenches in the European conflict are demanding real money. The franc, which is worth about 19.3 cents in American money; the mark, worth about 24½ cents, and the rupee, worth 48 cents in our money, all are in circulation in Europe at the present time. Since the United States has mostly all the gold, and what the others have got they are holding on to, so silver coinage has come into its own. There is more silver coinage now than every before.

Mr. H. H. Reama, president of the New York Branch, was introduced and gave a brief address, congratulating the Newark Branch on its work of the past year, and on their well equipped laboratory.

Mr. Mitchel, chemist of Tiffany and Company, gave a short address on elementary chemistry and a standardization of chemicals.

The following officers were installed by Mr. Haddow for the year 1916-1917:

President—Mr. Edward W. T. Faint.
Vice-President—Mr. Louis H. O'Donnell.
Financial Sec.-Treas.—Mr. Philip Sievering.
Recording and Cor. Sec.—Mr. George Reuter, Jr.
Librarian—Mr. O. J. Sizelove.
Sergeant-at-Arms—Mr. Theodore Kreuder.
Asst. Sergeant-at-Arms—Mr. Joseph Binder.
Trustees—Mr. Smith, Mr. Merrigold and Mr. Berfels.

At the last meeting of this branch we received two new members, the first we have taken in since the society organized a little over a year ago.

Mr. O. Cole gave an interesting explanation of his experience with double salt nickel solution, which started a lively discussion between the exponents of the single and double salts. This took up the greater part of the evening.

The rest of the evening was spent in telling the delegates what to do and what not to do while in Cleveland.

TORONTO.

Meets fourth Tuesday of each month at Occident Hall. Bathurst and Queen Streets. Secretary, Ernest Coles, P. O. Box 5, Coleman P. O., Toronto, Ont.

The regular meeting of the Toronto Branch was held in Occident Hall on Thursday, June 26th, with Pres. Salmon in the chair. A good attendance was present and enjoyed a pleasant and profitable evening. The entrance of our Sup. Pres. Barrows was the signal for an outburst of hand clapping, this being the first intimation to the majority of the members of his return. A gratifying feature of the meeting was the election of four new active members. After routine business the members were entrtained by Mr. Barrows with a talk on his trip in Florida, which proved very entertaining.

A discussion on copper plating, also the cause of nickel plate peeling on ice cream apparatus, brought a very successful meeting to a close.

DETROIT.

Meets first Tuesday of each month at 26 East Congress Street. Secretary, B. E. Miller, 543 Townsend Avenue, Detroit, Mich.

Owing to the 4th of July falling on our regular meeting the meeting was postponed to the 11th of July, which was held with our newly elected president in the chair. There was a good attendance.

Moved and supported that our Librarian, Mr. Lovering, take up the minutes on paper and discussions, which are to be forwarded to the members of the Detroit Branch who live outside of Detroit.

The balance of the evening was taken up by the delegates and members who attended the Cleveland convention.

PROVIDENCE.

Meets second and fourth Wednesday of each month at No. 60 Weybosset Street. Secretary, Albert J. Lemrise, 124 Waverly Street, Providence, R. I.

The first regular meeting held June 14th was opened by the president. The secretary notified the Branch of having accepted Mr. Walter Fraine, Sup. Secretary of the A. E. S., as delegate to the convention. The board of managers examined the secretary's and treasurer's books and reported favorably on same.

A visitor from the New York Branch, Mr. George Wiegand, was presented to the Providence members by the secretary. He

addressed them in a very interesting manner. Several electroplating problems of interest were discussed until a late hour.

The second regular meeting was opened by the president.

Remarks frmo Mr. George Wiegand, Mr. Hugh McGuinness and Mr. Robert H. Moore were well appreciated by the members. Very important discussions relating to 14 karat, rose gold, bright silver and stripping solutions, also several oxidizes and gun metals were the feature of the meeting.

BRIDGEPORT.

Meets third Friday of each month at the office of the Brass World, 260 John Street, Bridgeport, Conn. Secretary, Nelson Barnard, 858 Howard Ave., Bridgeport, Conn.

MILWAUKEE BRANCH.

Meets first Friday of each month at West Side Bank Building, Third and Chestnut Streets. Secretary, E. C. Yaeger, 962 Ninth Street, Milwaukee, Wis.

CINCINNATI.

Meets once each month at Dennison Hotel, Cincinnati, Ohio. Secretary, F. H. Nordmann, 720 Froom Ave., Cincinnati, Ohio.

TOLEDO BRANCH.

Meets the last Tuesday of each month at Toledo University. Secretary, James E. Nagle, 209 Navarre Ave., Toledo, Ohio.

CLEVELAND BRANCH.

Meets once a month at American House. Secretary, Charles Werft, 1775 East Sixty-eighth Street, Cleveland.

ROCHESTER.

Meets second and fourth Friday of each month at University of Rochester. Secretary, C. V. Haring, 603 Dewey Avenue, Rochester.

APPLICATIONS FOR MEMBERSHIP.

Tfledo Branch.

D. P. Ryan.....1944 Broadway, Toledo, O.
John M. Doolin.....1357 Prospect Ave., Toledo, O.
Walter W. Weilner.....411 Hind St., Toledo, O.

Cleveland Branch.

Wm. V. Crater.....342 Prospect Ave., Canton, O.

Philadelphia Branch.

W. G. Rogers.....366 N. Hanover St., Pottstown, Pa.
Paul Gorling.....3909 N. Dellis St., Philadelphia, Pa.

Milwaukee Branch.

E. Werner.....527 Third St., Milwaukee, Wis.
E. Hespe.....63 Second St., Milwaukee, Wis.

Toronto Branch.

A. H. Densen—
Brownmanville Hdw. Co., Brownmanville. Ontario, Can.
E. Avery.....Berliner Graphophone Co., Montreal, Can.

PROVIDENCE BRANCH.

Christopher O'Brien (associate)....44 Borden St., Providence, R. I.
Frederick P. Scott (associate).....44 Borden St., Providence, R. I.
Henry Stockman (associate)...76 Chestnut St., No. Attleboro, Mass.
Cornelius O'Connor.....37 Everygreen St., Providence, R. I.
James Flynn.....Lakewood, R. I.
William Riley.....64 Eddy St., No. Attleboro, Mass.
John F. McDonough.....16 Prairie Ave., Providence, R. I.
Edward Carrigan.....1757 Chestnut St., No. Attleboro, Mass.

DETROIT BRANCH.

Frank Powers.....care H. Muller Mfg. Co., Sarnia, Ontario, Can.
John C. Miller.....114 N. Valley Ave., Grand Rapids, Mich.

NEW YORK BRANCH.

Harry Harman.....59 Cedar St., New York City
Lewis H. Austen.....Rosebank, Staten Island, N. Y.
George T. Eddy.....11 Liberty St., Brooklyn, N. Y.

ELECTED TO MEMBERSHIP.

BRIDGEPORT BRANCH.

Harold R. Fray.....Woolson St., Watertown, Conn.
Chas. L. Newill.....1214 N. Main St., Waterbury, Conn.
John Rall.....65 Liberty St., Bridgeport, Conn.
W. E. Roche.....1613 Park Ave., Bridgeport, Conn.

CLEVELAND BRANCH.

F. L. Greenwald.....16015 Park Grove, Ave., Cleveland, O.
Bert L. Clain.....care Cleveland Foundry Co., Cleveland, O.

PROVIDENCE BRANCH.

Robt. H. Moore.....43 Pennsylvania Ave., Providence, R. I.

PHILADELPHIA BRANCH.

A. R. Redgrave.....72nd and Powers Lane, Philadelphia, Pa.
Frank O'Neal.....1922 W. Somerset St., Philadelphia, Pa.
Burton C. Willis.....72nd and Powers Lane, Philadelphia, Pa.

TORONTO BRANCH.

Albert T. Davey.....451 Montrose Ave., Toronto, Ont.
Arthur L. Chilton.....1112 Dovercourt Road, Toronto, Ont.
John H. Collins.....175 Geoffrey St., Toronto, Ont.
J. A. Bloxell.....1672 St. Urbain St., Montreal, P. Q.

TOLEDO BRANCH.

Walter W. Weilner.....411 Third St., Toledo, O.
John M. Doolin.....1357 Prospect Ave., Toledo, O.
D. T. Ryan.....1966 Broadway, Toledo, O.

CHANGE OF ADDRESS.

G. D. Holdom.....61 Bisler Ave., Dayton, O.
Will Hartzell.....62 McClure St., Dayton, O.
J. H. Johnston.....43 Parker St., Mansfield, O.
Gus Jelinek.....5320 W. 24th Pl., Cicero, Ill.
Royal F. Clark.....3 Winfield St., East Norwalk, Conn.

Mr. Clark has transferred from Newark Branch to Bridgeport Branch.

THE CLEVELAND CONVENTION.

By E. G. Lovering, Detroit Branch.

'Twas a balmy day in Cleveland, and a jolly crowd was there;
They filled the Hotel Statler, right near the jubilee square,
In that beautiful City of Cleveland, with parks so pretty and fair,
The Electro Platers' Convention were welcomed by Cleveland's mayor.
Delegates from the north and south and west, and you bet the east was there,
For the bunch from the broad Atlantic were there with lard in their hair.
It was surely good to see Barrows back with his pipe and smile,
That Southern hospitality has got Cobalt beat a mile.
When the delegates were seated, Ter Doest took things in hand.
You've got to hand it to that boy for he worked to beat the band.
This Ter Doest is surely a genius, he can plate wood minnows so bright.
If you hung one in Richard's cellar, even Fred Liscomb would bite.
The meeting is opened and we are all listening to Mr. Beman's remarks.
He is the man in Cleveland who chases the bums from the parks.
The official reports went off smoothly, and then we all got a chance
To hear of the marvelous record of Colonel Hansjosten Horse Hans.
Then Hogaboom spoke of preparedness, and that wire backing Wilson was fine.
You can't get ahead of the Colonel, he said, give Woodrow that horse of mine.
And then we listened to Proctor and also to Liscomb—our Dad.
And the presence of Shepherd on his honeymoon, surely made every one glad.
I'm entirely too modest to mention Richard's boric acid joke,
But I knew that something was coming off when he peeled off his coat.
When that show me bunch from Missouri got busy, St. Louis, you know,
Beat New York for the next convention, though those speed boys put up a brave show.
It surely was one fine big gathering, the boys that stayed home missed a treat,
I wouldn't miss such a convention, if cyanide sores covered my feet.

YOU CANNOT GET SOMETHING FOR NOTHING.

Can you answer yes to any or all of the following questions:

Do you regularly attend meetings?

Do you talk plating to brother platers.

Do you lean on the Society?

Do you help push the Society's efforts along.

Do you contribute out of your knowledge and experience for the benefit of the Society?

Do you profit by your membership in the Society?

If you cannot answer yes to most of the above questions you are giving nothing and receiving the same.